

CLAIM AMENDMENTS

Please amend Claims 1, 14, 15, 23, 27, 52 and 53 as follows.

1. (Currently Amended) An image pick-up apparatus comprising:

a plurality of photoelectric conversion elements ~~and~~ having switching elements, arranged on ~~a~~ an insulating substrate, wherein thicknesses of said photoelectric conversion elements having switching elements, measured in a direction normal to the insulating substrate, are different so as to form a step between a top of each photoelectric conversion element and a top of a peripheral area thereof;

a wavelength converter positioned and configured to convert incident radiation to light having a wavelength detectable by said photoelectric conversion elements;

a protective layer arranged on said insulating substrate so as to cover said photoelectric conversion elements and said switching elements; and

an additional layer, arranged on a surface of the protective layer;

wherein a material of said additional layer is different from that of said ~~protection~~ protective layer;

wherein a surface of the additional layer is flatter than the surface of the ~~protection~~ protective layer; and

wherein the wavelength converter comprises a columnar crystal scintillator deposited on a flat surface of said additional layer

2. (Previously Presented) An image pick-up apparatus according to Claim 1, wherein the additional layer is obtained by flattening the protective layer provided on the substrate.

3. (Previously Presented) An image pick-up apparatus according to Claim 1, wherein the additional layer comprises a polyimide resin.

4. (Previously Presented) An image pick-up apparatus according to Claim 1, wherein a second additional layer is provided on the wavelength converter.

5. (Previously Presented) An image pick-up apparatus according to Claim 4, wherein the second additional layer covers the end face of the wavelength converter.

6. (Original) An image pick-up apparatus according to Claim 1, wherein the surface of the wavelength converter is flattened.

7. (Previously Presented) An image pick-up apparatus according to Claim 4, wherein a light reflection film is provided on the second additional layer.

8. (Previously Presented) An image pick-up apparatus according to Claim 6, wherein a light reflection film is provided on the wavelength converter.

9. - 10. (Cancelled)

11. (Previously Presented) An image pick-up apparatus according to Claim 1, wherein the scintillator comprises a CsI crystal.

12. (Original) An image pick-up apparatus according to Claim 7, wherein the light reflection film is made of an aluminum film.

13. (Original) An image pick-up apparatus according to Claim 8, wherein the light reflection film is made of an aluminum film.

14. (Currently Amended) An image pick-up apparatus according to Claim 8, having plural ~~sensor~~ insulating substrates.

15. (Currently Amended) An image pick-up apparatus comprising:  
comprising:  
a plurality of insulating substrates arranged on a substrate;  
a plurality of photoelectric conversion elements ~~and~~ having switching elements, arranged on each of the insulating substrates, wherein thicknesses of said photoelectric conversion elements having switching elements, measured in a direction normal to the insulating substrate, different so as to form a step between a top of each photoelectric conversion element and a top of a peripheral area thereof,

a wavelength converter configured and positioned to convert incident radiation to light having a wavelength detectable by the said photoelectric conversion elements;

a protective layer arranged on the insulating substrates so as to cover the the photoelectric conversion elements and the switching elements; and

an additional layer arranged on a surface of the protective layer,

wherein a material of the additional layer is different from that of said ~~protective~~ photoelectric layer,

wherein a surface of the said additional layer is flatter than the surface of said protective layer, and

wherein the wavelength converter comprises a columnar crystal scintillator deposited on a flat a surface of the said additional layer

16. (Previously Presented) An image pick-up apparatus according to Claim 15, wherein the additional layer is obtained by flattening the protective layer provided on the insulating substrate.

17. (Previously Presented) An image pick-up apparatus according to Claim 15, wherein the additional layer comprises a polyimide resin.

18. (Previously Presented) An image pick-up apparatus according to Claim 15, wherein the additional layer is arranged on the plurality of insulating substrates.

19. - 20. (Cancelled)

21. (Previously Presented) An image pick-up apparatus according to Claim 15, wherein the scintillator comprises a CsI crystal.

22. (Cancelled)

23. (Currently Amended) An image pick-up system comprising:  
an image pick-up apparatus including: a plurality of photoelectric conversion elements ~~and having~~ switching elements, arranged on ~~a~~ an insulating substrate, wherein thicknesses of said photoelectric conversion elements having switching elements, measured in a direction normal to the insulating substrate, are different so as to form a step between a top of each photoelectric conversion element and a top of a peripheral area thereof; a wavelength converter configured and positioned to convert incident radiation to light having a wavelength detectable by the photoelectric conversion elements; a protective layer arranged on ~~the~~ said insulating substrate so as to cover the photoelectric conversion elements ~~and the~~ said switching elements; and an additional layer on a surface of the protective layer;  
wherein a material of said additional layer is different from that of ~~the~~ said protective layer,  
wherein a surface of the additional layer is flatter than the surface of ~~the~~ said protective layer, and  
wherein the wavelength converter is comprises a columnar crystal scintillator deposited on a flat surface of ~~the~~ said additional layer;

a signal processor configured to process the signal from the image pick-up apparatus; and

a display configured to display the processed signal from the signal processor.

24. (Previously Presented) An image pick-up system according to Claim 23, further comprising a telecommunication device configured to transfer the signal from the signal processor.

25. (Previously Presented) An image pick-up apparatus system to Claim 23, further comprising a recorder configured to record the signal from the signal processor.

26. (Previously Presented) An image pick-up system according to Claim 23, further comprising a storage device configured to store the signal from the signal processor.

27. (Currently Amended) An image pick-up system comprising:  
a plurality of insulating substrates arranged on a substrate; a plurality of photoelectric conversion elements and switching elements, arranged on each of the insulating substrates, wherein thicknesses of said photoelectric conversion elements having switching elements, measured in a direction normal to the insulating substrate, are different so as to form a step between a top of each photoelectric conversion element and a top of a peripheral area thereof; a wavelength converter configured and positioned to convert incident radiation to light having a wavelength detectable by the photoelectric conversion elements; a protective layer arranged on the insulating substrates so as to cover the plurality

of photoelectric conversion elements and switching elements; and an additional layer arranged on a surface of the protective layer;

wherein a material of said additional layer is different from that of the said protective layer,

wherein a surface of the additional layer is flatter from the surface of the said protective layer, and

wherein the wavelength converter comprises a columnar crystal scintillator deposited on a flat surface of the said additional layer;

a signal processor configured to process the signal from the image pick-up apparatus; and

a display configured to display the processed signal from the signal processing means.

28. (Previously Presented) An image pick-up system according to Claim 27, further comprising a recorder configured to record the processed signal from the signal processor .

29. (Previously Presented) An image pick-up system according to Claim 27, further comprising a telecommunication device configured to transfer the signal from the signal processor.

30. (Previously Presented) An image pick-up system according to Claim 27, further comprising a storage device configured to store the signal from the signal processor.

31. - 51. (Canceled)

52. (Currently Amended) An image pick-up apparatus comprising:  
a plurality of photoelectric conversion elements ~~and~~ having switching elements, arranged on ~~a~~ an insulating substrate, wherein thicknesses of said photoelectric conversion elements having switching elements, measured in a direction normal to the insulating substrate, are different so as to form a step between a top of each photoelectric conversion element and a top of a peripheral area thereof;  
a wavelength converter configured and positioned to convert incident radiation to light having a wavelength detectable by the photoelectric conversion elements;  
a protective layer arranged on the substrate so as to cover the photoelectric conversion elements and switching elements; and  
an additional layer arranged on a surface of the protective layer;  
wherein a material of said additional layer is different from that of ~~the~~ said protective layer,  
wherein a surface of the additional layer is flatter than the surface of ~~the~~ said protective layer,  
wherein the wavelength converter comprises a columnar crystal scintillator deposited on a flat surface of ~~the~~ said additional layer, and  
wherein the photoelectric conversion elements comprise non-crystalline semiconductor material.

53. (Currently Amended) The image pick-up apparatus according to Claim 52, wherein the photoelectric conversion elements comprise an amorphous silicon



film, and the peripheral area of each photoelectric conversion element comprises an adjacent switching element.